Food Monitoring System Using IOT

D.Venkata Lakshmi[1], N.Harshitha[2], S.V.R.Chaitanya[3], K.Madhu Babu[4]
[1]*Asst.Prof,EIE Dept., Lakireddy Bali Reddy College of Engineering, Mylavaram, JNTUK*
[2,3,4] *EIE Dept., Lakireddy Bali Reddy College of Engineering Mylavaram, JNTUK*

***Abstract*— Food safety and hygiene might be a major concern in order to avoid food waste. The quality of the food should be monitored, and it should be protected against putrefaction and decay by elements such as temperature, humidity, and darkness in the environment. As a result, usinghigh-quality surveillance devices in grocery stores is beneficial. These high-quality monitoring systems keep an eye on environmental issues that cause or hasten food degradation. Later, environmental conditions such as refrigeration and vacuum storage will be managed. Throughout this article, the same food quality monitor will be constructed, which will be capable of monitoring environmental elements such as temperature, humidity, alcohol level, and light exposure. The gadget is manufactured the Arduino NANO is a prototyping board that is becoming increasingly popular. The Arduino board is connected to a variety of sensors, including the DHT-11, which measures temperature and humidity, and the MQ3, which measures methane level. This might be an IOT gadget with an academic degree that provides data from the device to an academic degree IOT platform. The Arduino is interfaced with the ESP0 Wi-Fi equipment to connect it to the internet via a Wi-Fi router. The data from the gadget will be presented on a temperament LCD that is connected to the Arduino NANO. The embedded spot IOT platform is utilized for work and device data monitoring.**

I.INTRODUCTION

The food we tend to consume will influence in style of spoilage which will occur during storage or chemical changes due to the time of storage at intervals. Due to the contamination of food by various micro-organisms, the area results in food borne diseases like norovirus. About three lakh fifty one thousand people are being affected due to this food contamination every year globally. Thanks to the technology which allows us to preserve food by artificial means through which we can increase the time span of food storage and reduce the ill health of the individual. It's very essential to implement a system which will facilitate to spot the contamination level on the food. We propose a system which will provide a management system to show the quality level of food with respect to its freshness, in order to implement we take the need of some electrical connections and biosensors.

To find the contamination caused by the microorganism in food sample, the vital role is played by biosensor. In-addition to this, it also supports the type of output assembled to this system. The proposed system mainly shows the contamination level with respect to its surrounding temperature and humidness. The change in temperature can affect the contamination level of the food. Therefore, we set some threshold values for particular area of the food, so that the food remains fresh. Besides temperature and humidness, sunshine conjointly affects the contamination level of food. Scarcity in decent light on food can spoil it. Hence, lights which are artificial with respect to area on food through sensors will be provided whenever there is a meager in sunshine. We propose a system to observe the levels of gases evolving from the food with respect to spoilage. We use gas sensors (MQ series) to produce analog values of the gas levels discharged from the food which are then displayed on the monitor.

II. LITERATURE SURVEY

The main concern of this project is based on the framework of food monitoring so that the food will not get spoiled during storage and transportation when the conditions surrounded are taken into account. To know the food nutrition value which is affected due to parameters like temperature, moisture and light the information and values are recorded in sensors. The involvement of the transportation factor the information the shipment location will provide through application. The information and values that are recorded can be retrieved using mobile

application. The web server is used to store the values of data in real time from sensors. For the

MQ3 sensor

Fig.2.MQ3 Sensor

further analysis of the recorded values it provides graphical representation. To interface with the users like third party stakeholders to get information of the food stored.

Safety of the food is a major publish health issue. Food poisoning is raised from illnesses of incidents. To monitor the spoilage of food, the government of Australia adopted HACCP systems to manage and identify food hazards politically. Exploring different places is started through agencies in Australia for food safety monitoring. The quality monitoring and food safety is done using monitoring index.

III. BLOCK DIAGRAM

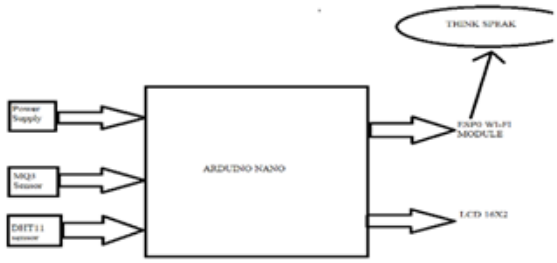

Fig.1. Block Diagram

The Grove - Gas Sensor (MQ3) module can be used to detect gas leaks (in home and industry). It can detect alcohol, benzene, CH4, hexane, LPG, and carbon monoxide. Measurements may be made as soon as possible because to its high sensitivity and short latent time.

MQ-3 gas detector has a high sensitivity to alcohol and a good resistance to gas, smoke, and vapour disturbance. This gadget produces a degree analogue resistive output that is supported by the presence of alcohol. When alcohol gas is present, the sensor's physical phenomena increase in tandem with the gas.

Fig.3. DHT11 Sensor

The DHT11 may be a basic, radical low- priced digital temperature and wetness sensing element. It uses an electrical phenomenon wetness sensing element and a semiconductor device to live the encompassing air, and spits out a digital signal on the info pin (no analog input pins needed). It's fairly easy to use, however requires careful temporal order to grab information. Only 3 pins the area unit obtainable for use: VCC, GND, and DATA. The communication method begins with the information line was causing to begin signals to DHT11, and DHT11 receives the signals and returns a solution signal. Then the host receives the solution signal and begins to receive 40-bit humiture knowledge (8-bit humidness the whole number+8-bit humidness decimal + 8-bit temperature the whole number + 8-bit temperature decimal + 8-bit checksum).

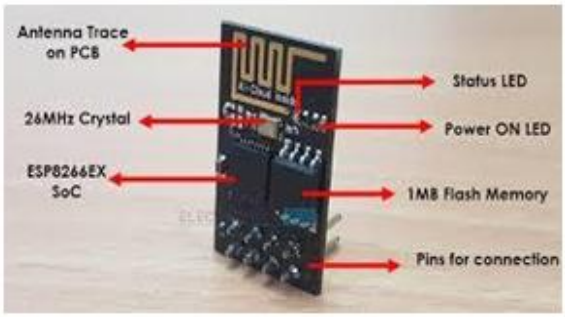

Fig.5 ESP-01 WIFI Module

The ESP8266 ESP-01 is a Wi-Fi module that allows microcontrollers to connect to a wireless network. As a result, we tend to be able to provide internet connectivity to a microcontroller in the same way as the Wi-Fi defend can to the Arduino, or we tend to be able to simply configure the ESP8266 to not only have access to a Wi-Fi network, but also to serve as a

microcontroller. The ESP8266 is a Wi-Fi enabled system on chip (SOC) module developed by Espressif. It is mostly used in IOT (Internet of Things) embedded applications. The ESP8266, developed by Shanghai-based Chinese manufacturing company Espressif Systems, could even be a suitable Wi-Fi semiconductor with full TCP/IP stack and microcontroller functionality. The ESP8266 may either host an application or take over all the Wi-Fi networking functions from another application processor.

Each ESP8266 Wi-Fi module is pre-programmed with AT command set code, so you'll be able to simply connect it to your Arduino device and get the most quantity Wi-Fi capability that a Wi-Fi defends provides.

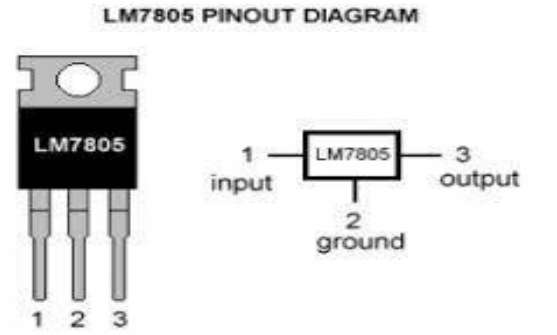

Fig.7. LM7805 pins

The LM7805 may be a transformer that produces 5volts.Such as more switch with in the retail, It's a three-pin Integrated Circuit IC; input pin for acceptive incoming Direct Current DC voltage, ground pin for establishing ground for the switch, and output pin that provides the positive five volts. Product Features: 3-Terminal Regulators. The name 7805 signifies 2 which means, “78” implies that it's a positive transformer and “05” implies that it provides 5V as output. Thus our 7805 can offer a +5V output voltage. The Output current of 7805ncan go up to 5A.

Fig.8.I2C Module

Only two multiple gutter strip, SDA and SCL, are used for details transmit. Both these lines are pulled high Serial Data (SDA) — This tack is used to convey and obtain details. The clock signal is carried by the serial clock (SCL).

It's very simple; all you have to do is insert the I2C into the LCD's ports and solder it in place. Then attach the SCL tack to the Arduino's A4 pin and the SDA tack to the Arduino's A5 tack.

Forth Step is Open, where a menu will be shown including all the sketches. By clicking on, one we can open it within the current window which provides an option of overwriting its content.

Fifth step is Save, where we can Saves our sketch.

Sixth step is Serial monitor, where we can have the option of opening the serial monitor.

Fig.10.Arduino Nano

The Arduino comprises of five functional elements: text editor, house for messaging, console dedicated for text related options, button toolbar for executing common functions and a set of menus used for different applications. Main application of this software is to connect the suitable and reliable hardware designed to program transfer and communication purposes.

Writing Sketches

Writing sketches are nothing but the programs written using Arduino code, and these sketches will be included in text editor.

This editor can provide the functions of modifications like cut, paste, search and replace. This provides a feedback on saving and commerce combined as display errors. The text output and error message along with various data will be displayed using the console. The toolbar buttons provides us to verify and transfer programs, open, create, save sketches, and also opens the serial monitor.

*First step is to **Verify**, where we will check for the errors during compilation.*

*Second step is to **Upload**, where we compile the code and upload it to the configured board.*

*Third step is **New**, where we create a new sketch.*

*Forth Step is **Open,** where* a menu will be shown including all the sketches. By clicking on, one we can open it within the current window which provides an option of overwriting its content.

*Fifth step is **Save,** where we can* Saves our sketch.

Sixth step is **Serial monitor**, where we can have the option of opening the serial Monitor.

IV. IMPLEMENTATION

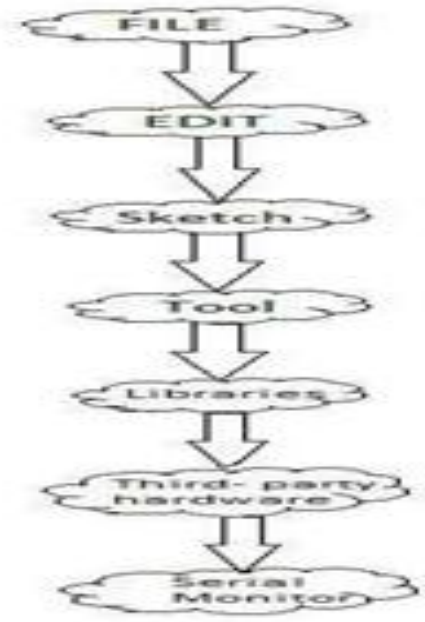

Figure.11. Flow Chart

V. ADVANTAGES

- Extend the life of fruits and vegetables.
- Keep a clean and sanitary environment.
- Back up data to the cloud for later examination.
- Minimize business losses.
- Boost commercial revenue.
- Help to reduce food waste

VI. APPLICATIONS

- It is used in fruit and vegetable markets.
- It is used in an agriculture farm.
- This technology can be used in flower stores.

VII. RESULT

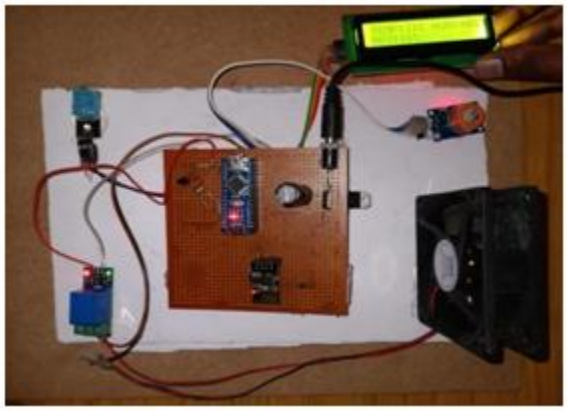

Figure.12. Connections of the Block Diagram

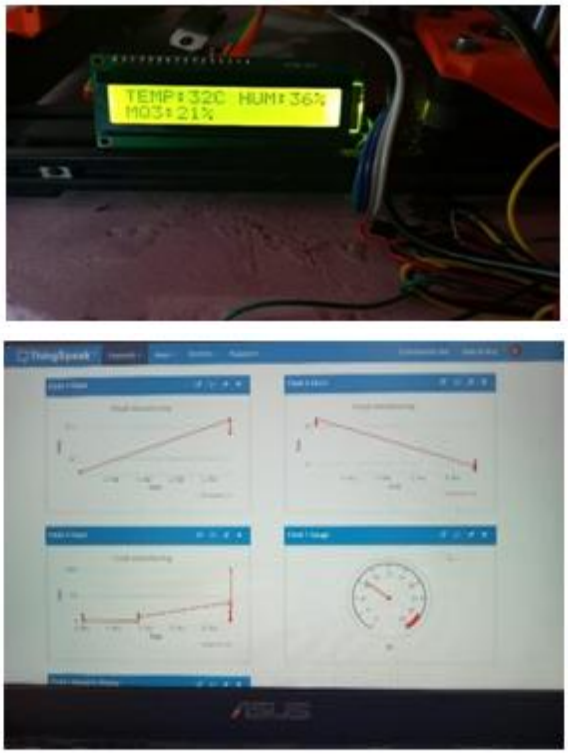

Figure.13. Monitoring various sensors Information using IOT

VIII. CONCLUSION

One of the world's most critical issues is food waste. Improper warehouse management is only wonted source of food waste; yet, with today's technology advancements, this is a resolvable issue to some extent. Based on various studies and solutions to the current problem, we have come to the conclusion that the IOT sector will provide a very cost-effective solution to the current problem.

As a result, we've addressed how diverse environmental conditions, such as a food-monitoring system powered by IOT, will be managed. Moisture and temperature levels that must be maintained at a certain level to prevent food from spoiling. It also has a user interface through an app that simply monitors the temperature and humidity parameters so that we can keep the temperature and humidity at a safe level and reduce food waste.

IX FUTURE SCOPE

The further purpose of the project is directly the consumer deal with the dealer directly through the website by see food quality chart. We can see the website about the quality of the product of the food i.e., fruits and the vegetables through the website of the dealer.

Whenever the scarcity of the food occurs, the remaining food will be stored and monitor not gets spoiled.

REFERENCE

[1] Yousefi H., Ali M M., Su H M., Filipe C D., and Didar T F. (2018). Sentinel wraps: Real-time monitoring of food contamination by printing dnazyme probes on food packaging. ACS Nano, (pp.3287–3294)

[2] Min C., Jiafu W., and Fang L. (2012). Machine-to machine communications: Architectures, standards and applications. KSII Trans. Internet Inf. Syst, (pp.480–497)

[3] Wisitsoraat A., TuantranontComini E., Sberveglieri G., and Wlodarski W. (2009). Characterization of n-type and p-type semiconductor gas sensors based on NiOx doped TiO2 thin films, Thin Solid Films, (pp. 2775–2780)

[4] Abdullah M Z., Aziz S A., and Dos Mohamed A M. (2000). Quality inspection of bakery products using a color-based machine vision system, Journal of Food Quality, (pp. 39–50)

[5] SyedaErfanaZohoraA M., Khan A K., Srivastava A. (2013). Electronic Noses Application to Food Analysis Using Metal Oxide Sensors: A Review, Journal of Soft Computing and Engineering, (pp. 79–84)